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ABSTRACT

This study investigated student teachers' perception and practice regarding computer use during the practicum in terms of their teaching styles. The following questions were investigated: (1) What are the student teachers' perceptions of the teachers' role in the classroom with computers, measured in terms of teacher-centeredness and student-centeredness? (2) How did the student teachers use the computer during their practicum, measured as teacher-centered computer use and student-centered computer use? and (3) Are there any differences between the student teachers' perceptions of the teachers' role and their practice of computer use during the practicum? The results of the study showed that there was no significant difference between student teachers' perceptions of teacher-centered roles and their perceptions of student-centered roles teaching in the classroom with computers. The student teachers indicated that they would engage teacher-centered activities and student-centered activities on an equal basis while teaching in classrooms with computers. Nevertheless, results showed that there was a significant difference between the student teachers' teacher-centered computer use and their student-centered computer use during the practicum. The student teachers used the computer significantly more as a teacher-centered tool than as a student-centered tool. (Contains 21 references.) (MES)

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Abstract: This study investigated the student teachers perception and practice regarding the computer use during the practicum in terms of their teaching styles. The student teachers' teaching styles were measured as teacher-centeredness and student-centeredness. The result of the study showed that there was no significant difference between student teachers' perceptions of teacher-centered roles and their perceptions of student-centered roles teaching in the classroom with computers. The student teachers indicated that they would engage teacher-centered activities and student-centered activities on a equal basis while teaching in classrooms with computers. Nevertheless, the test showed that there was a significant difference between the student teachers' teacher-centered computer use and their student-centered computer use during the practicum. The student teachers used the computer significantly more as a teacher-centered tool than a student-centered tool.

Literature Review

It is a long and complicated process to prepare prospective teachers using technology in their future teaching practice. For more than a decade, teacher education has been offering computer training courses in the hope that the newly graduates would be confident and competent computer users once they are on job. "To realize any vision of smarter schooling by using technology, ...college of education must prepare teachers to use the technology. Adequate teacher preparation is probably the most important determinant of success" (Hancock & Betts, 1994; p. 29). Nevertheless, research indicates that the computer use of the newly graduates was low. When the newly graduates did use computers, their use fell into the traditional teaching practice and related to low level of instructional activities (Novak & Knowles, 1991; Olive, 1994).

It is far from an adequate training by simply teaching prospective teachers computer skills. The study by Diem (1989) found that the prospective teachers seemed to have mastered the necessary technical skills, however, they had difficulties incorporating computers in instructional activities. "They could identify parts of the computer....However, they could not delineate how the computer fit into their subject matter content areas" (p. 35). Dunn and Ridgway's studies (1991a, 1991b) yielded the same result. They found that prospective teachers could not embrace the wide range of instructional uses of computers although the majority of them reported that they did not experience problems technically while using the computer.

In order to successfully integrate computers in the teaching practice, it is imperative that prospective teachers develop appropriate teaching styles where computers can fit in to impact

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student learning. Researchers were concerned about the prospective teachers' perception of the role of the computer in the learning process. The prospective teachers during the practicum (Dunn & Ridgway, 1991a, 1991b) did not consider the computer's role as a one to develop students' higher order thinking skills as much as a one to develop students' computer skills and they adopted the Noah's Ark' teaching style and would send students in pairs to get their "weekly dose of the computing" which were not related to their learning task.

Teaching with computers requires a shift from the traditional teaching style. Computers changed the arrangement of classrooms (Chin & Hortin, 1993-94), social organization of student learning (Becker, 1985), and interactive patterns between teachers and students (Riel, 1989). Classrooms need to be arranged in a way so that students and teachers could move around for individual and group work. Computers facilitated more independent learning. Students assisted each other completing the learning task and solving problems collaboratively often with their teachers as partners. Students participated in the evaluation process and frequently evaluated each other' work. Teachers worked with individual students and small groups rather than directing the attention to the whole class. (Becker, 1985; Keirns, 1990; Riel, 1989; Sandholtz, 1990). "The direction of their change was toward child-centered rather than curriculum-centered instruction" (Dwyer, 1991; p. 50).

Educators are aware that there is a need to redefine the teachers' role and revise extant teaching practice in order for computers to have an impact upon school curriculum. "Technology forced a re-evaluation of the authoritative teacher role" (Chin & Hortin, 1993-94; p. 83). Research found that technology-enriched classrooms tend to be more student-centered rather than teacher-centered. The concurrent agreement is that the teachers' role has been shifted from an "information dispenser" to a "coach" (Sheingold & Hadley, 1990); from a "centralized authority" to a "decentralized facilitator" (Chin & Hortin, 1993-94), and from a "sage on the stage" to a "guide at the side" (Cifuentes, 1997).

The discussion of the teachers' role shift has significant implication to teacher education. The instructional technology (IT) training in teacher education should reflect and lead the trend and edge in the field of educational computing. What are prospective teachers' perceptions of the teachers' role in the classroom with computers? How will they use computers when they are placed in the classroom with computers? The answers to these questions will help teacher education to adjust and improve their IT training courses accordingly.

Student teaching is a crucial period for education majors. Their experiences in this period help prepare their future teaching style. "It is in these experiences that education majors become acquainted with the realities of life in elementary and secondary classrooms, look for real-world connections to content presented in their university foundations and teaching methods classes, and develop their instructional and managerial skills" (Hunt, 1995; p. 37).

Research is scarce on student teachers in the field of educational computing. A few studies were conducted to examine this crucial period (Diem, 1989; Dunn & Ridgway, 1991a; 1991b; Downes, 1994; Wang & Holthaus, 1998-99). These studies mainly focused on student teachers' computer training adequacy and the frequency of their computer use during the practicum. While these research did attempt to investigate the pattern of the student teachers' computer use, the pattern was more often than not described by the types of software involved.

"Questions remain unanswered on the nature of student teachers' computer use" (Wang, 1999-2000). Up to date, no study has ever been conducted to evaluate the student teachers' perception of the teachers' role in the classroom with computers and their computer use in terms of teacher-centeredness and student-centeredness. This study was conducted to gain insight into student teachers' teaching style and their computer use during the practicum in terms of teacher-centeredness and student-centeredness.

The Purpose of the Study

This study investigated the following questions: (1) What are the student teachers' perceptions of the teachers' role in the classroom *with* computers? The student teachers' perception of the teachers' role is to be measured as teacher-centeredness and student-centeredness. (2) How did the student teachers use the computer during their practicum? The student teachers' computer use is to be measured as the teacher-centered computer use and the student-centered computer use. (3) Are there any differences between the student teachers' perception of the teachers' role and their practice of the computer use during the practicum?

Method

Sample

This setting for the study was at a public university in a territory of the United States in the Pacific Rim. The sample for this study was all the student teachers (N=48) who have completed student teaching in May 1999. A survey questionnaire was the data collection instrument for this study. The survey was adapted from the one originally developed by Bichelmeyer, Reinhart and Monson at the Indiana University to measure teachers' perceptions of the teachers' role in the classroom in the information age (1997). It contains three sections: (1) demographic information; (2) student teachers' perception of teachers' role in the classroom *with* computers; (3) student teachers' computer use during the practicum.

Instrument

The data collection instrument for this study was a survey questionnaire adapted from the one originally developed by Bichelmeyer, Reinhart and Monson at the Indiana University to measure teachers' beliefs about the teachers' role teaching with technology. The survey questionnaire contains three sections; (1) Demographic Information; (2) Student Teachers' Perception of the Teachers' Role in the Classroom with Computers; (3) Student teachers' perceived teacher-centered computer use and student-centered computer use.

Section 1 contained six items collecting subjects' personal information (1) gender; (2) major; (3) birth date; (4) number of years at the university; (5) years of computer experience; (6) grade levels likely to teach.

Section 2 included 12 items on a likert scale (1-5 points) measuring student teachers' perceptions of the teachers' role in the classroom *with* computers. Six items dealt with teacher-centeredness while the other six items student-centeredness. Teacher-centeredness defined the teachers' role primarily as (1) planning instructional activities for the whole class; (2) being the main directing force in conducting the class; (3) keeping order and quiet in the classroom, (4) presenting lectures; (5) attending the class as a whole; (6) being the main resource in the student learning process. Student-centeredness defined teachers' role as (1) collaborating with students in planning lessons; (2) providing individualized learning objectives; (3) using authentic assessment methods; (4) evaluating students on individual basis; (5) including students in the evaluation process; and (6) creating student sub-groups for class projects.

Section 3 collected data on the student teachers' computer use during the practicum. Six items in this section were teacher-centered computer use and six items were student-centered computer use. The teacher-centered computer use was defined as teachers using computers to (1) create instructional materials; (2) find resources; (3) communicate with others; (4) keep track of students' grades; (5) present information to the class; and (6) provide computer enrichment activity. The student-centered computer use was defined as students using computers to (1) create learning resources; (2) find resources for learning activities; (3) communicate with others; (4) present information; (5) complete class projects; and (6) engage in computer hands-on learning activities.

Data Analysis and Results

Data was analyzed by using SPSS (Statistical Package for Social Sciences).

(1) What are student teachers' perceptions of the teachers' role in the classroom *with* computers? Paired-sampled *ttest* was used to compare the means of student teachers' perceptions of the teacher-centered role and the student-centered role in the classroom with computers. The comparison showed that there was no significant difference ($t=.48$ $p>.05$) between student teachers' perceptions of teacher-centered roles (M=3.8704 S.D.=.856) and their perceptions of student-centered roles (M=3.8407 S.D.=..864) in the classroom with computers.

(2) What was the student teachers' computer use during the practicum in terms of teacher-centeredness and student-centeredness? Paired-sampled *ttest* was used to compare means for the student teachers' teacher-centered computer use and the student-centered computer use. The comparison showed that there was a significant difference ($t=7.48$ $p=.000$) between the student teachers' teacher-centered computer use (M=3.2037 S.D.=.1.113) and the student-centered computer use (M=2.1905 S.D.=.1.096).

(3) Do the student teachers' perception of the teachers' role in the classroom with computers differ from their practice of the computer use during the practicum? Paired-sampled *t test* was used to compare the means of the student teachers' perception of the teachers' role and their computer use during the practicum. The comparison showed that there was a

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significant difference between student teachers' perceptions of the teacher-centered role in classrooms with computers and their teacher-centered computer use (t= 3.62 p=.001). There was a significant difference between student-teachers' perceptions of the student-centered role in classrooms with computers and their student-centered computer use during the practicum (t= 8.78 p=.000).

Discussion

The student teachers in this study perceived no significant difference between the teacher-centered role and the student-centered role in classrooms with computers. The data indicated that they would likely to engage teacher-centered activities as well as student-centered activities in classrooms with computers. These student teachers seemed to prefer a combined teaching-style which balanced teacher-centered activities and student-centered activities rather than a dichotomous teaching style leaning towards teacher-centeredness or student-centeredness. They considered the two types of teaching styles are complimentary rather than exclusive to each other.

This result was confirmed by Bichelmeyer's study (1997). Bichelmeyer's study measured the practicing teachers' perception of the teacher' role in the classroom with computers. Her study showed that teachers perceived no significant difference between the teacher-centered role and the student-centered role in the classroom with computers. The participants in both studies did not appear to share the popular belief that the availability of technology in the classroom changes the teacher-centered teaching style completely to the student-centered teaching style.

Although the student teachers perceived no significant difference between the teacher-centered role and the student-centered role in the classroom with computers, their computer use during the practicum revealed quite a different picture. There was a huge gap between the teacher-centered computer use and the student-centered computer use. These student teachers used the computer significantly more as a teacher-centered tool than a student-centered tool. There are several possibilities that might explain this discrepancy.

One possibility was that these student teachers lacked strategies to use the computer as a student-centered tool. Although these student teachers had completed university IT courses, their IT courses might get them to the level of using computers as a teacher-centered tool, but not a student-centered tool. The student-centered computer use requires diffe. nt strategies including scheduling the computer use, using different classroom management skills, designing curriculum-related activities, and developing evaluation methods accordingly. Their computer use might reflect their IT training orientation which exposed them adequately to the teacher-centered computer use, but not the student-centered computer use. "Few courses relate teachers' delivery styles to what types of materials and activities they select and it is even more difficult to find courses that are addressing teaching styles and how they impact the use and misuse of technology" (Flake & Molina, 1995; p. 337).

The student-centered computer use develops through practice. Downes (1993) observed the student teachers' computer use throughout three practicums and noticed there were shifts in the way student teachers' using computers with students. Student teachers' computer use with students progressed from Practicum 1 to Practicum 3. University IT training courses should be grounded in practice. Parkinson (1998) suggested that IT training courses should be taught through university-based component and the school-based component. "It needs to be borne in mind that the influence and importance of the school-based component is beyond dispute - certainly with student teachers" (p. 69). Field experience should be an integrated component of IT courses. Prospective teachers should be offered opportunities to observe how classrooms teachers use computers with students and be able to practice computer uses in real classroom settings.

Practicum school environments play a central role influencing student teachers' computer use (Downes, 1994; Pakinson, 1998; Wang & Holthaus, 1998-99). Student teachers need a supportive practicum environment to be able to use computers with students. "Practicing teachers are role models for student teachers. Student teachers learn from their cooperating teachers as well as other practicing teachers they observe" (Wang & Holthaus, 1998-99). Student teachers are facing many challenges as they are trying to cope with their first experience in the real classroom setting. Often they are mentored into the culture of the practicum school. "Pressure existed on student teachers to conform to the instructional patterns of their cooperating teachers. If the cooperating teachers did not use the computer as part of their instruction, the student teachers did not have models to follow" (Diem, 1989; p. 35).

Hardware and software resources in practicum might be another reason why the student-centered computer use was low in this study. Although the abundance of hardware and software does not necessarily determine the student teacher' computer use, using computers with students is demanding on the availability and convenient access to computer hardware and software. Most practicum schools in this study have limited computer resources. On one hand, limited resources present difficulties that hinder the student teachers' computer use. On the other hand, it is a challenge to teacher education to prepare prospective teachers how to utilize limited IT resources in schools to its maximum to enhance the quality of teaching and learning.

There was a discrepancy between the student teachers' perception of their teaching styles and the practice of their teaching styles. This discrepancy might also be an indication that student teachers would take a balanced approach in terms of the teacher-centered computer and the student-centered computer use if they were not constrained by external circumstances. On the other hand, it might indicate that student teachers would always perform lower than they themselves expect due to "external circumstances or those over which they have no control unless they are extraordinarily motivated" (Marcinkiewicz, 1994-95; p. 194).

Conclusion

This research is the first attempt to investigate the student teachers' perception and practice of the computer use during the practicum in terms of their teaching styles. The findings of this study have important implications to teacher education IT programs. IT courses at the university should lead the trend and edge of IT practices in the classroom instead of lagging behind it. Teacher education needs to offer IT courses that emphasize the appropriate teaching styles regarding the computer use and expose prospective teachers to strategies and models

of student-centered computer use. It would be a nightmare if our graduates have to undo what they have been trained in teacher education programs once placed in classrooms with technology.

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